



## ARMIS @ BARC

Computer and GIS Unit  
 Bangladesh Agricultural Research Council (BARC)  
 AIC Building (2<sup>nd</sup> Floor)  
 Farmgate Dhaka-1215 Bangladesh  
 Web: [www.barc.gov.bd](http://www.barc.gov.bd)

# ARMIS @ BARC

An Initiative to Improve  
 Agricultural Research Planning  
 Process through Informed Decision Making



Bangladesh Agricultural Research Council

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Capacity Enhancement of NARS through ICT  
based Agricultural Research Management  
Information System (ARMIS)



Computer and GIS Unit  
**Bangladesh Agricultural Research Council**  
Dhaka Bangladesh

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## 1. Understanding agricultural context

Agriculture sector is at the peak in driving the wheels of economic development of Bangladesh. In spite of the gradual decline, the present share of agriculture towards GDP is around 18.5%. Whatever be the case, the total volume of contribution of agriculture to the GDP has increased, and still it remains the predominant sector in terms of employment and livelihood. Food security and poverty alleviation are mostly influenced by agriculture and related macroeconomic activities. As foreseen in the visionary plan of the government, Bangladesh has to reduce its import dependency of different produce and become self reliant not only in cereal but also on other items.

Major challenges for Bangladesh agriculture are to elevate productivity and profitability, by addressing among others the issues like; minimize loss of arable land, increase resource-use efficiency, reduce cost of production, tackle adverse effect of natural hazards and climate change, ensure safe production of food and their supply to the consumers etc. Policy dimensions of agricultural growth encompasses more scientific and technological innovations and their effective dissemination to the users. This obviously demands progressive and considerable increase in the investment of public expenditure in research. It is imperative that, in a resource scarce country like Bangladesh, investment by priority is highly desirable and needs to be done at any cost. It is notable to mention here that, under the headship of BARC, the research priorities in Bangladesh agriculture by the year 2030 and beyond have been determined and under implementation by the relevant institutions. Research undertaking suffers due to low investment in Agricultural R&D by public and insignificant by private sector. The investment in agriculture needs to be increased to a certain level in order to create a congenial environment and allow the actors to pursue activities without disruption.

## 2. Role of research in agriculture

The main objective of the national agricultural research system (NARS) organizations under the leadership of the Bangladesh Agricultural Research Council (BARC), are to generate demand-led technologies/information and scale-up those for wider adoption. Priorities are given to address the agro-ecologically constrained areas that are more prone to weather vagaries and inhabited by proportionately higher population of poor and vulnerable group. It is recognized that, there has been commendable success in agricultural R&D - particularly in rice and vegetable over the last three decades. There exists mounting concern however, among the scientists and policy planners on the ways to meet the growing demand of the increasing population in the coming days as the country's natural resource base is shrinking and degrading. The picture is bleak when the impact of climate change matter is transported into the scenario. This is really a dreadful challenge for the nation. A break through in agricultural R&D can only ease the situation. Concerted efforts for effective research and development with policy support would be the key instrument for increasing productivity and production to cope with future demand.

## 3. Justification of undertaking ARMIS project

To undertake new research, the past and on-going research information are needed i) to decide on the course of action ii) to avoid wasteful duplication and iii) for economization of scarce resource. Proper documentation with updated information and their availability in time is thus vital. Things become easier and time saving, if the required information largely could be extracted from a single source.

As it is known to all, in Bangladesh the NARS institutions (in total 13 numbers), the Universities and quite a number of other agencies are long been engaged in agricultural research and development activities. Through their work, they have by now, generated a significant number of problem solving technologies which have notably contributed towards elevation of agricultural productivity and in attaining self sufficiency in food; specifically cereals.

Besides, much useful research information have also been made available; which are acting as an input for further investigation and in making research more responsive to the complexity and demand. Unfortunate though, in many cases these technologies/innovated information are scattered and not maintained in an organized manner as a central database system. As a result, either these information are lost or not readily available to plan and initiate new research programs/projects. Providing the researchers and the development practitioners; appropriate information and in time is crucial for success of the endeavour. In this perspective, a central depository could assist by way of providing the required research information for analytical and need-based planning of future research leading to economization by avoiding wasteful duplication.

Against the backdrop, for effective management of agricultural research, BARC as a part of its mandated responsibility undertook the ICT based research management information system project. ARMIS (stands for Agricultural Research Management Information System) project (title of the project actually is Capacity Enhancement of NARS through ICT-based Agricultural Research Management Information System) and is being implemented by the Computer and GIS Unit of BARC. Funded by the Krishi Gobeshona Foundation (KGF) initially for a period of seven months and then considering the reality and enormity of the work, duration extended further. The 1<sup>st</sup> phase was from September 2013 to March 2014 and the 2<sup>nd</sup> phase under execution since July 2014 is scheduled to end in December 2015. The total project cost after revision stands at BDT 3.88 crore.

## 4. How ARMIS can help

Essentially, ARMIS is a gizmo for informed decision making. The underlying principle of the ARMIS project is to provide a single source location of research information on projects / programs / activities in order to enable the research planners/managers and other users to make use of it. The configuration of ARMIS is intended to facilitate users to view, update, search/query and generate report according to the user's privilege and specific need. The ARMIS system once fully developed and operational will act as a decision support tool for the research managers to identify research needs and in initiating new research projects/programs as per priority.



## 5. ARMIS: for better management of research

For sustainable development of agricultural research; functionality of a modern agricultural research management system and access by all at all times to the near-real time information is crucial. For the agricultural development practitioners in general and the research community in particular, there is a crying need of a technological means for knowledge management to bring efficiency in research. In this context, establishment and maintenance of an effective Agricultural Research Management Information System (ARMIS) might be the solution. ARMIS, as a central depository could assist by way of providing the required research information for planning future research, understanding the strength and weakness of the past, economization of research by avoiding undesired duplication, identifying gaps and in undertaking new research through need analysis. In order to make the ARMIS practicable; development of a structured database, gathering required research information into the database and a user friendly retrieval device is very much essential. The ARMIS has been planned to be developed as a centralized and integrated online application system for collecting and managing research information.

The activities of the ARMIS have been designed to be executed in collaboration with all who have institutional responsibility and interest in activities in the broader area of agricultural research; covering land, soil, water, crop, livestock, fisheries, forestry, socio-economics, policy and environment etc. BARC as the custodian, shall be maintaining the research database in an organized, updated and sustainable manner even on expiry of the project.

Pertinent to mention here, during the late 1980's and early 1990's, a number of attempts were made for documenting research outputs; which due to various reasons could not been sustained. The sustainability of ARMIS has been ensured by establishing an in-built mechanism of information flow from various agencies through a two way system which may be perceptible from the conceptual diagram below.



## 6. Project objectives

The goal of the project is to develop an Agriculture Research Management Information System and make available a single location platform of required information for effective and efficient management of agricultural research in Bangladesh. The main objectives of the project are;

- To gather and input research projects/programs related information of NARS and other organizations and accordingly develop a comprehensive and effective ARMIS database and application.
- To ensure availability of information for the researchers, policy planners and others in an organized and timely manner through an ICT based communication channel and,
- To develop a sustainable repository/hub of agricultural research information/findings for the users with up to date information.



## 7. Implementation approach and methodology

A systematic approach with a common framework has been planned to be followed in developing the ARMIS database and application. This requires one-to-one and also collective activities with different institutions and individuals. In case of an agency, the person in charge of research or one designated by the head of the respective institution (referred to as Focal Point/Contact Person) will be responsible to coordinate with the project management and play supervisory role. Under her/his leadership; the activities of the functional units will advance covering collection, synthesis, structuring of data input as per the template and finally review of the research data and its approval for inclusion into the database. The appropriate functional units, to be determined in consultation with the ARMIS personnel by the Focal Point/Contact Person of an institution, shall have the freedom to input on-line research data.

All intended information/data relating to research projects/programs/activities shall have to be carefully organized as per program area and then by commodity/non-commodity etc. The details of the procedure may be found in the project website or may be obtained from the ARMIS project personnel.

ARMIS is an on-line initiative planned to collate, during its present tenure, nearly 20,000 research information/entries from the expanded list of agricultural R&D organizations of the country (total over 80 numbers including the recognized journals). Effort will be undertaken to collect information since 1971 to date. Published work in journals, reports, books etc. and also accomplished tasks documented will be given priority; while the ongoing work will not be excluded for the benefit of checking duplication and economy in resource investment.

Key challenges thus, remain with the gathering of huge volume of research project/program related data and entering those into the database after proper scrutiny and review. Besides data consolidation; constructive modification of the ARMIS application software developed during 1<sup>st</sup> phase, shall have to be done and switched over to Version 2 to adjust with the need as well. Accumulation and storage of the data will nonetheless, depend on the nature, quality and of course availability and willingness of the institution/individual to share the information.

## 8. Expected output / outcome

It is envisaged that, the service-oriented configuration of ARMIS will make it possible for the users from any corner of the globe to view, provide online input of information, update and search/query as well as generate desired report. The system will provide opportunity for sharing of research information, review and formulate new research proposals and also assist to avoid work duplication. It is expected that, the targeted volume of information will be able to provide a genuine representative picture of the agricultural research scenario of the country. Further, the process will facilitate services for the researchers to find and manage information efficiently and effectively and add value to their insight. The system will thus benefit all the stakeholders engaged in the broad field of agricultural research and development.

## 9. Project management and staffing

The Computer and GIS unit of BARC headed by its Director will provide overall guidance and oversee the project activities. The activities will be monitored by the unit and the relevant person(s) of the funding agency-the KGF. The project is headed by the Principal Investigator (PI) who is also the Senior System Analyst of the unit. The PI is the CEO of the project and he will be assisted by a Team headed by the Technical Coordinator; comprising a number of Agriculture Experts, Research Associates, Data Encoders and a couple of support staff.

The overall activities and day to day management, relating to the development and maintenance of ARMIS will be performed by the Principal Investigator in close collaboration with the Technical Coordinator and the project personnel. The activities of the project personnel will be governed by their respective ToRs and directions; as may crop up over time. To attain project success, it is imperative that, the Technical Coordinator, Agriculture Experts and others maintain close linkage with the targeted agencies and the persons involved in the process, stay pro-active and self motivated to act as per need. Likewise, it is expected that the participating agencies; as

a part of their institutional responsibility, to enrich the central database and to be a part of the pride of contributor in ARMIS; shall be self-responsive and continue to ensure 'free-flow' of the generated data/information even after expiry of the project. The project financing is committed by the KGF subject to submission of acceptable technical and expenditure reports as per set guideline and timeframe. Details of the ARMIS team/staffing may be find in the facing pages.

## 10. Human resource development

During the tenure of the ARMIS project, there remains adequate scope for orientation and awareness building of the persons involved in the activities, through organization of trainings/meetings/workshops etc. as these are integral building block for the successful implementation of the project.

Skill Development activities include in-country training and workshop programs both on the data entry process, use of the software, search of information and minimizing common mistakes in data input etc. Particular emphasis will be given in defining the program areas and classifying commodity and non-commodity in data entry, besides the mandatory information, as laid out in the questionnaire/format. Further, there is provision of arranging expert consultations and interaction as and when necessary with the focal point/contact persons, scientists and professionals in relevant disciplines of agriculture.

## 11. Clientele services

As the apex body of the NARS, BARC has the mandated responsibility of providing solutions to common, emerging and demanding needs of many different stakeholders. Among these, the NARS institutes, policy planners, three major public extension agencies, several public and private academic institutions, NGOs, private organizations, development partners and above all the agricultural research information users are of primary consideration. In allegiance to its citizen's charter, the BARC has full reverence to the RTI (right to information) and the project is an effort towards this direction.

The ARMIS project in its implementation arrangement has conspicuously integrated all these factors. In truest sense, the building philosophy of ARMIS is based on collective ownership with BARC as the custodian. In line with the mission of BARC; which is to plan, design and implement demand-driven research for generation of need-oriented information/technology and arrange dissemination, ARMIS is absolutely committed and shall be pursuing all these tasks. The project believes in collaboration and team effort and would relentlessly practice this rewarding notion in all their programs and activities. In the process of generation of research information and to scale up the output/outcome, the door will remain open for everyone who are interested to glorify ARMIS and make use of the system in contributing towards the agricultural development of Bangladesh.



## 12. The ARMIS team

### **Mr. Hasan Md. Hamidur Rahman - Principal Investigator**

Senior System Analyst

Computer and GIS Unit, BARC

Cell: 01553-270390 Email: h.rahman@barc.gov.bd

### **ARMIS Project Personnel**

#### **Mr. M. Anwar Iqbal - Technical Coordinator**

Cell: 01715-058182 Email: iqbal.anwar99@gmail.com

#### **Dr. Md. Abdul Quddus - Agriculture Expert**

Cell: 01786-280256 Email: quddus.rfsd@hotmail.com

#### **Dr. Md. Jahirul Islam - Agriculture Expert**

Cell: 01726-206560 Email: jahir.brri@gmail.com

#### **Dr. Md. Mamtazul Haque - Agriculture Expert**

Cell: 01713-002190 Email: mamtaz139@yahoo.com

#### **Dr. Md. Abdul Baset - Agriculture Expert**

Cell: 01552-334851 Email: basetecon@gmail.com

#### **Dr. Ahmad Ali Hassan - Agriculture Expert**

Cell: 01716-520707 Email: ahmadalihassan786@gmail.com

#### **Engr. Rajib Mahmud - Programmer (from September 2013 to March 2015)**

Cell: 01755-578981 Email: rajese04\_8@gmail.com

#### **Mr. Md. Akebul Sarder - Programmer**

Cell: 01723-336415 Email: akebulr@gmail.com

#### **Mr. Md. Maniruzzaman Munshi**

Cell: 01552-482849 Email: maniruz\_2008@yahoo.com

#### **Mr. Kazi Noor - E-Alam Jewel**

Cell: 01819-482046 Email: wwwjewel@gmail.com

#### **Ms. Arzumand Banu**

Cell: 01716-259552 Email: barzu\_du@yahoo.com

#### **Ms. Tania Sharmin**

Cell: 01196-091118 Email: taniasharmin089@gmail.com

#### **Mr. Rasel Bin Hossain (from September 2013 to January 2015)**

Cell: 01714-511111 Email: bin.rasel@gmail.com

#### **Mr. Md. Ariful Islam**

Cell: 01833-027042 Email: arman\_hssn@yahoo.com

#### **Ms. Rifat Parvin**

Cell: 01927-589915 Email: parvinrifat@gmail.com